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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Applicant: Colin

Serial No.: 09/830,096

Examiner: Van Pelt, Bradley J.

Filed: November 6, 2002

Group Art Unit: 3682

Title: ACTUATOR ASSEMBLY

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APPEAL BRIEF UNDER 37 C.F.R. § 1.192

Sir:

Subsequent to the Notice of Appeal filed on March 11, 2004, Appellant now submits this Appeal Brief under 37 C.F.R. § 1.192 appealing the Final Rejection dated December 12, 2003. Each of the topics required by 37 C.F.R. § 1.192 is presented in this Brief and is labeled appropriately.

A check in the amount of \$330 is enclosed for the filing fee. If any additional fees or extensions are required, the Commissioner is authorized to charge Deposit Account No. 50-1482, in the name of Carlson, Gaskey & Olds.

I. REAL PARTY IN INTEREST

Meritor Light Vehicle Systems (UK) Limited is the real party in interest of the present application. An assignment of all rights in the present application to Meritor Light Vehicle Systems (UK) Limited was executed by the inventor and recorded by the U.S. Patent and Trademark Office at Reel 013482, Frame 0566.

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II. RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences known to Appellant, the Appellant's legal representative, or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claim 20 has been allowed. Claims 5 and 6 were objected to as being dependent on rejected base claim but would be allowable if rewritten in independent form including the limitation of the base claim and any intervening claims. Claims 1-4 and 7-18 stand finally rejected. The claims are presented in the Appendix. Accordingly, the Appellants hereby appeal the final rejection of claims 1-4 and 7-18.

IV. STATUS OF AMENDMENTS

A proposed after final amendment to claim 1 was not entered by the Examiner. Further, in the Final office action dated December 12, 2003 the Examiner had objected to amendments to the specification and drawings as new matter. Appellant traversed the Examiner's objection in an after Final response submitted February 11, 2004. The Advisory Action mailed on February 25, 2004 does not include any indication as to the current status of the amendments to the specification or drawings.

V. SUMMARY OF INVENTION

This invention is an actuator for a door lock or door latch for a vehicle. An object of the invention is to provide a compact actuator assembly that is easy to install and has relatively few components.

The actuator assembly 10 includes an electric motor 12 that includes a body portion 14 and a shaft 16. A gear rack 22 includes a boss 24 for pivotally mounting the gear rack 22 to the body portion 14. The gear rack 22 includes an array of gear teeth 20 arranged in an arcuate manner. A pinion 18 drivingly engages the array of gear teeth 20 such that the gear rack 22

moves back and forth about an axis 25A. The axis 25A extends through the body portion 14. (Page 2, paragraphs 6 and 7, Figure 1).

The motor 12 and gear rack 22 are surrounded by a housing 42 to prevent contaminants from interfering with operation of the motor 12 and gear rack 22. The housing 42 includes two parts having cut outs 46,50 that accept the shaft 16 of the motor 12. The housing 42 also includes an opening 40 to accept the boss 24 of the gear rack 22. (Proposed Figures 1A, 1B, 1C, 3 and the first and second paragraphs on page 3).

The gear rack 22 includes two stops 26, 28 that limit movement of the gear rack 22 relative to the body portion 14. A guide portion 30 connects the stops 26, 28 resulting in increased strength of the stops 26, 28. The Guide portion 30 includes a guide surface 32 that prevents separation of the gear teeth 20 from the pinion 18 (Figure 1, last paragraph on page 3).

The application as finally amended includes independent claims 1, 17 and 20. Claim 20 has been allowed. Claims 1 and 17 recite an actuator assembly including a motor 12 with a body portion 14, a drive shaft 16 and a pinion 18 directly fixed to the drive shaft 16 to always rotate in unison with the drive shaft 16. The pinion 18 is drivingly engaged to an array of gear teeth 20 of a gear rack 22, wherein the gear rack 22 is pivotally mounted via a pivot about a pivot axis 25A. Claim 1 includes the further limitation that the array of gear teeth 20 includes a first side adjacent the motor 12.

VI. REFERENCES OF RECORD

In the Final Rejection dated December 12, 2003 the Examiner relied upon a single prior art reference:

- (1) U.S. Patent No. 5,009,296 to Ohkawa et al. ("Ohkawa et al.").

VII. ISSUES

The issues addressed in this Appeal are:

- (1) whether claims 9-15 are patentable under 35 U.S.C. § 112, first paragraph as being based on an enabling disclosure: and
- (2) whether claims 1-4,7,8,and 16-18 are patentable under 35 U.S.C. § 102(b) over Ohkawa et al.

VIII. GROUPING OF CLAIMS

For purposes of this Appeal, the claims are grouped as follows:

- (1) Claims 1, 2, 3, and 16 stands or fall together;
- (2) Claim 4 stands alone;
- (3) Claim 7 stands alone:
- (4) Claim 8 stands alone;
- (5) Claims 17 and 18 stand or fall together; and
- (6) Claims 9-15 stand or fall together.

IX. ARGUMENTS

- (1) Claims 9-15 is enabling under 35 U.S.C. § 112, first paragraph.

The office action states that claims 9-15 contain subject matter that was not described in the specification in such a way as to enable one skilled in the art to make and use the invention. Specifically, the office action states that the structure of the housing recited in Claims 9-15 is not sufficiently clear. Appellant disagrees.

The invention is directed toward an actuator for a door lock or latch such as is used in a vehicle door. Housings are common to actuators and other mechanisms included within a door lock and latch. As such, a housing is a limitation well known to those skilled in the art. Further, the use of corresponding openings to support and secure a shaft of an electric motor is a common and well known feature within the art. Further, supporting a shaft is also known across other fields of art as is evidenced by the structure used to support the shafts (130) in Ohkawa et al.

The limitations present within the claims were included with the original disclosure and include detailed descriptions of the housing structure for each claim. Claim 9 depends from claim 1 and includes the limitation of a housing in which the motor is secured. The specification includes the description "The motor is secured in the housing, preferably by engagement of each end of the drive shaft with the housing". (Specification, page 3, first paragraph).

Claim 10 includes the limitation that the pivot is mounted on the housing; claim 11 includes the limitation that the pivot includes a boss of the gear rack to which a lever is attached. Claim 12 recites the limitation that the boss at least partially projects through the housing. The specification as filed includes the description that the gear rack includes a boss 24 that fits into a hole of a housing to provide a pivot (Specification, page 2, last paragraph).

Claim 13 recites that the drive shaft engages the housing. Claim 14, recites that the housing is substantially sealed and claim 15 recites that the housing has at least a first and second part, the parts having co-operating cut-outs to provide for at least one end of the drive shaft. The specification includes the description that preferably the housing is of at least two part form, a first part having two cut-outs, each accepting and supporting one end of the drive shaft, the second part having complementary cut-outs which in conjunction with the first part provide a journal bearing for each end of the drive shaft 16. (Specification, page 3 second paragraph). The limitations described in the claims are present within the original specification and provide sufficient description for a worker skilled in the art to understand what is claimed.

Accordingly, because the level of skill in the art, and the fact that it is commonly known to provide a housing to both prevent intrusion of contaminants and to support shafts and other structures, claims 9-15 fulfill the enablement requirement. As such a worker skilled in the art would understand and recognize what is claimed. The description as originally filed fulfills the requirements of 35 USC § 112 because the description is adequate, and because the knowledge in the art is such that the limitations of the claimed invention would be evident to a worker skilled in the art. The rejection to claims 9-15 should therefore be reversed.

(2) Claims 1, 2, 3, and 16 are patentable under 35 U.S.C. § 102(b) over Ohkawa et al.

Independent claim 1 recites the limitation of a pinion *directly fixed* to a drive shaft to always rotate in unison with the drive shaft. This limitation requires that the pinion be fixed directly to a drive shaft and always rotate in unison with the drive shaft, not simply driven by the drive shaft. The final office action states that this limitation is disclosed by Ohkawa et al. in Figure 1. Appellant disagrees. In fact, Ohkawa et al. states that when a traveling electromechanical clutch (150) is disconnected, the gear (151) is released relative to the rotation of the motor (140) (Column 5, lines 24-26). Such a disclosure does not meet the limitations recited in claim 1.

Ohkawa et al. discloses the pinion gear (151) that is not *directly fixed* to the output shaft (141) and does not always rotate in unison with the output shaft (141). Contrary to claim 1, the Ohkawa et al. pinion (151) is driven by an electromechanical clutch (150) through a contact that is typical of a clutch for engaging a driven member (Ohkawa et al. Col. 4, lines 18-20).

Ohkawa et al. discloses a motor (140) that moves within a base frame (110) to drive one of a plurality of operating shafts (130). The motor (140) drives an output shaft (141) and two electro-mechanical clutches (150,160). The electro-mechanical clutch (150) selectively engages a pinion (151) to move the motor (140) between the output shafts (130). Once the motor (140) is moved into alignment with a desired operating shaft (130) the electro-mechanical clutch (150) disengages the pinion (151) to prevent further movement of the motor (140). The second electro-mechanical clutch (160) then engages and drives the operating shaft (130).

The Ohkawa et al. pinion (151) is not *directly fixed* to the output shaft (141) and does not always rotate in unison with the output shaft (141). Instead, the pinion (151) is driven by the electromechanical clutch (150) through a frictional contact that is typical of a clutch for engaging a driven member with a driving force (Ohkawa et al. Col. 4, lines 18-20). As is understood, typical clutch engagement utilizes a friction force to selectively provide the desired driving force.

The Examiner stated that the mechanical clutch (150) in between the pinion (151) and the motor shaft (141) could always be engaged to rotate the pinion (151) and therefore anticipates functional language in claim 1. (Final rejection dated December 12, 2003, section 8) However, the limitation "*a pinion directly fixed*" is a structural limitation, not a functional limitation. Ohkawa et al does not meet the structural limitation of *a pinion directly fixed* to a drive shaft. This is so because the pinion (151) is not directly fixed to the shaft, but instead is driven through an interface with the electro-mechanical clutch (150). Frictional engagement between the electro-mechanical clutch (150) and the pinion (151) does not meet the limitation of *a pinion directly fixed* to a drive shaft. Therefore, the limitations contained in claim 1 define over the clutch driven arrangement disclosed by Ohkawa et al.

For these reasons, Ohkawa et al. does not meet the limitation of a pinion directly fixed to a drive shaft as recited in claim 1, the rejection of claim 1 should be reversed. Further, claims 2,3 and 16 ultimately depend from claim 1 and are therefore also in allowable form.

(3) Claim 4 is patentable under 35 U.S.C. § 102(b) over Ohkawa et al.

Claim 4 depends from claim 1 and includes the limitation that the gear rack includes at least one stop to limit movement of the rack relative to the body portion. The office action identified straight sides (117) of the base frame (110) as being "stops" (Ohkawa et al. Figure 1). The straight sides (117) are not stops but instead are merely sides of a housing within which the motor (140) operates. In Ohkawa et al., the motor (140) moves to precise points between the straight sides (117) to align with one of the plurality of shafts (130). Movement is not restricted by any stop member or

configuration. Accordingly, Ohkawa et al does not disclose a stop. Therefore, the rejection of claim 4 should be reversed.

(4) Claim 7 is patentable under 35 U.S.C. § 102(b) over Ohkawa et al.

Claim 7 depends from claim 4, and includes the further limitation that the drive shaft passes between the array of gear teeth and a guide portion proximate to the gear teeth. This limitation requires that the drive shaft of the motor extends through a guide portion. The office action identified upper plate (112) and lower plate (113) (shown in Ohkawa et al Figure 2) as the guide portion. The upper plate (112) and the lower plate (113) merely cover portions of a housing protecting the motor (140) and are not guide portions. Neither plate (112,113) contacts nor guides the motor (140) or the output shaft (141). Further, the Ohkawa et al disclosure provides no support or description of the upper and lower plates (112, 113) acting as a guide. Accordingly, the limitation in claim 7 of a guide portion is not disclosed by Ohkawa et al. and the rejection to claim 7 should be reversed.

(5) Claim 8 is patentable under 35 U.S.C. § 102(b) over Ohkawa et al.

Claim 8 depends from claim 4 and includes the limitation that the guide portion is supported by each stop. This limitation recites specific structure for the guide portion that is not disclosed by Ohkawa et al. The office action has indicated that the side walls (117) were stops and that the upper and lower plates (112 and 113) are the guides. These structures in Ohkawa et al are merely part of a housing surrounding the motor (140) and nothing in Ohkawa et al. provides motivation to support the interpretation as anything more than simply parts of a housing. The rejection to claim 8 should therefore be reversed.

It is understood by Appellant that the limitations of the claims are to be interpreted broadly, however, the claim language recites limitations to a specific structure that simply are not met by the disclosures of Ohkawa et al. Accordingly, the rejection to claims 4,7, and 8 should be reversed.

(4) Claims 17-18 are patentable under 35 U.S.C. § 102(b) over Ohkawa et al.

Claim 17 is directed toward an actuator assembly including a motor having a body portion, a drive shaft and a pinion directly fixed to the drive shaft. Claim 17 requires that the pinion be directly fixed to the drive shaft. As discussed above, the Ohkawa et al. pinion (151) is not *directly fixed* to the output shaft (141) and does not always rotate in unison with the output shaft (141). The pinion (151) is driven by the electro-mechanical clutch (150) through a typical clutch interface (Ohkawa et al. Col. 4, lines 18-20). A typical clutch interface utilizes frictional forces to transfer a driving force.

The Ohkawa et al. pinion (151) is driven by a selective engagement with the electro-mechanical clutch (150). The pinion (151) is not directly fixed to the drive shaft. Even when the electro-mechanical clutch (150) is engaged and driving the pinion (151), the pinion (151) is not directly fixed to the drive shaft. If the pinion (151) can even be said to be “fixed” to anything it is temporarily “fixed” to the electro-mechanical clutch (150). Such a driving configuration is simply not the same as being directly fixed to the drive shaft as is required to meet the limitations of claim 17.

Accordingly, the limitation in claim 17 that the pinion is directly fixed to the drive shaft defines over the electro-mechanical clutch (150) and pinion (151) of Ohkawa et al. Therefore, the rejection to claim 17 is improper and should be reversed. Further, claim 18 depends from claim 17 and is therefore also allowable.

X. CONCLUSION

For the reasons explained above, the final rejection of claims 1-4,7-18 is improper and should be reversed.

Respectfully submitted,

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CERTIFICATE OF MAILING

I hereby certify that this appeal brief (in triplicate) is being deposited with the United States Postal Service as First Class Mail, postage prepaid, in an envelope addressed to Mail Stop Appeal Brief, Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on May 11, 2004.

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XI. APPENDIX

Claims on appeal

1.(Previously Presented) An actuator assembly including a motor having a body portion, a drive shaft, and a pinion directly fixed to the drive shaft to always rotate in unison with the drive shaft, the pinion drivingly engaging an array of gear teeth of a gear rack, the array of gear teeth having a first side adjacent the motor, and the gear rack is pivotally mounted via a pivot about a pivot axis wherein said pivot axis is on a motor side of said array of gear teeth.

2.(Previously Presented) The actuator assembly as recited in claim 1 in which the pivot axis passes through the body portion.

3.(Previously Presented) The actuator assembly as recited in claim 1 in which the pivot axis is proximate an end of the motor remote from the pinion.

4.(Previously Presented) The actuator assembly as recited in claim 1 in which the gear rack includes at least one stop to limit movement of the rack relative to the body portion.

5.(Previously Presented) The actuator assembly as recited in claim 4 in which each stop engages the drive shaft.

6.(Previously Presented) The actuator assembly as recited in claim 5 in which each stop engages a portion of the drive shaft on the side of the pinion remote from the motor.

7.(Previously Presented) The actuator assembly as recited in claim 4 in which the drive shaft passes between the array of gear teeth and a guide portion proximate the gear teeth.

8.(Previously Presented) The actuator assembly as recited in claim 7 in which the guide portion is supported by each stop.

9.(Previously Presented) The actuator assembly as recited in claim 1 which further includes a housing in which the motor is secured.

10.(Previously Presented) The actuator assembly as recited in claim 9 in which the pivot is mounted on the housing.

11.(Previously Presented) The actuator assembly as recited in claim 9 in which the pivot includes a boss of the gear rack to which in use a lever is attached.

12.(Previously Presented) The actuator assembly as recited in claim 11 in which the boss at least partially projects through the housing.

13.(Previously Presented) The actuator assembly as recited in claim 9 in which the drive shaft engages the housing.

14.(Previously Presented) The actuator assembly as recited in claim 9 in which the housing is substantially sealed.

15.(Previously Presented) The actuator assembly as recited in claim 9 in which the housing has at least a first and second part, the parts having co-operating cut-outs to provide for at least one end of the drive shaft.

16.(Previously Presented) The actuator assembly as recited in claim 1 in which the pivot is mounted on the body portion.

17.(Previously Presented) An actuator assembly including a motor having a body portion, a drive shaft, and a pinion directly fixed to the drive shaft to always rotate in unison with the drive shaft, the pinion drivingly engaging an array of gear teeth of a gear rack with the gear rack mounted for movement on the body portion.

18.(Previously Presented) The actuator assembly as recited in claim 17 in which the motor is an electric motor.

19. (Cancelled)

20. (Previously Presented) An actuator assembly comprising a motor having a body portion and a drive shaft, the drive shaft being drivably connected to a pinion, the pinion drivingly engaging an array of gear teeth of a gear rack pivotally mounted for movement about a pivot axis, the array of gear teeth having a first side adjacent the motor and at least one stop engaging the drive shaft to limit movement of the gear rack relative to the body portion.